To: Art Smith[Smith.Art@epa.gov]; Jerry Schulte[jschulte@orsanco.org]; Gilbert, John[Gilbert.John@epa.gov]
From: Kelly, Jack (R3 Phila.)
Sent: Tue 2/4/2014 9:17:20 PM
Subject: FW: New NSF funded studies on odor threshold and other issues

This may be of interest...

Jack Kelly
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EPA Region III, Philadelphia
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-----Original Message-----
From: Kelly, Jack (R3 Phila.)
Sent: Tuesday, February 04, 2014 3:49 PM
To: Werner, Lora; Burns, Francis; Caporale, Cynthia; Larry F Cseh; Ed Murray; Christopher Weis; Helverson, Robert; Markiewicz, Karl
Subject: RE: New NSF funded study w/VA tech on MCHM odor threshold

All: I didn't read all of the email Lora sent but this 1/30/14 Charleston Gazette article mentions three studies to be funded.

http://www.wvgazette.com/News/201401300040

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-----Original Message-----
From: Werner, Lora
Sent: Tuesday, February 04, 2014 1:52 PM
To: Burns, Francis; Kelly, Jack (R3 Phila.); Caporale, Cynthia; Larry F Cseh; Ed Murray; Christopher Weis; Helverson, Robert; Markiewicz, Karl
Subject: New NSF funded study w/VA tech on MCHM odor threshold

This was a helpful article from a couple of days ago - I missed it until I saw it in our news clips today. I didn't know anything about this NSF-funded study. Has any one seen the study plans?

Fyi Larry, EPA R3's interview w/Ken is not until 2 pm, right before yours.

Lora

Study examines MCHM odors in water
Charleston Gazette, The -- 1/31/2014 Charleston, WV

Study examines MCHM odors in water
By Ken Ward Jr., The Charleston Gazette, Jan. 31, 2014 Two weeks ago, when the state and the water company told West Virginia residents to begin flushing their home plumbing systems, they said not to worry if the water still smelled like black licorice after they were done.

"Any lingering smell, which is expected, is not a health issue," said the "How to Flush Your Plumbing System" pamphlet posted online by West Virginia American Water on the morning of Jan. 13.

Water company officials and state government representatives repeatedly told the public that Crude MCHM from the Elk River chemical leak had a "low odor threshold." People would smell it in their water at levels far below what was dangerous, those company and government officials said.

The problem was the "material safety data sheet" from Eastman Chemical, which made the chemical that leaked from Freedom Industries, said there was "no data available" on Crude MCHM's odor threshold. State officials have offered varying figures for what they believe an odor threshold for the chemical might be. In some cases, they haven't made clear where they got their numbers, and the best estimate the state seems to have was apparently provided after the water company's flushing guidance was issued.

Now, though, a new National Science Foundation-funded study announced earlier this week has as one of its central goals to figure out exactly how small a concentration of Crude MCHM humans can smell, and how that number compares to levels that could pose public health risks.

"I do have a sense that we have a lot of numbers out there for an odor threshold," said the study's lead researcher, Andrea Dietrich, a Virginia Tech environmental scientist and engineer.

Experts seem to agree that, while they don't know a specific number, the odor threshold for MCHM is low. But Dietrich said that doesn't mean West Virginia officials should have ignored the potential for lingering odors in the region's drinking water.

"It's part of water quality," Dietrich said Thursday. "Just because there's not a health effect, annoying odors are still annoying and aren't supposed to be in the water."

Dietrich's study is one of three new emergency projects that the NSF is funding to help West Virginia residents get answers about the chemical leak that a foundation official called "one of the largest human-made environmental disasters in this century."

The studies focus on a variety of unknowns: How much of the chemicals from the leak might remain inside home plumbing systems; what the potential human health effects are; and exactly what sorts of steps could be taken to prevent future incidents.

In her study, Dietrich plans to learn more about the chemical and physical properties of Crude MCHM. Among other things, this work will include trying to establish an accurate odor threshold, according to information made public by the NSF.

A summary of Dietrich's study plan indicates that the chemical is believed to have "a low aqueous odor threshold," which means that "consumers can potentially become important monitoring sentinels for exposure to low levels" of the chemical.

"The main location in the house to detect off-odors is the shower because of high water temperatures and water flows in a confined area," the summary said. Dietrich plans to develop models of chemical air concentrations for typical showering conditions.

"This will confirm if consumer sensory detection can aid in detecting locations of residual MCHM," the summary said. "It will also aid in the utility's understanding of consumer complaints, and in the longer term will aid in exposure assessment through inhalation."

On Jan. 13, four days after the Freedom Industries leak, water company officials and the state government began a weeklong process of lifting broad "do not use" orders for sections of the nine-county area impacted by the MCHM leak. After the order was lifted, residents were advised to run their hot water for 15 minutes, their cold water for 5 minutes and their outside faucets for 5 minutes, to flush the chemical from their homes.

However, since then, residents have continued to complain that the black-licorice smell of the chemical is lingering, especially in their hot water.

State officials, in announcing their guidance for flushing, rejected an earlier recommendation from the federal Agency for Toxic Substances and Disease Registry that residents be advised to flush their plumbing systems until the chemical odor is gone.
In a Jan. 10 email message to the state's Department of Health and Human Resources, the ATDSR said it did not "anticipate any adverse health effects" if levels of MCHM were below 1 part per million in drinking water.

"That said, because of the odor and not knowing an odor threshold, we would also recommend that the system or residents be told to flush their systems until it was no longer observed," wrote Larry F. Cseh, emergency response coordinator for ATSDR's U.S. Public Health Service.

Also, early in the incident, the federal Environmental Protection Agency had said in internal documents that flushing the chemicals out of the system "may require a fairly prolonged time to complete," perhaps two to three weeks.

After most residents had completed the flushing process and the do-not-use order was lifted, the Gov. Earl Ray Tomblin's administration issued a news release that said MCHM could "temporarily adhere to plastic pipelines . . . resulting in a lingering licorice odor for some time." The release, issued Jan. 18, said the chemical could be smelled at concentrations far below the level where adverse health effects might occur.

Lawrence Messina, a spokesman for the West Virginia Department of Military Affairs and Public Safety, said those statements were based on consultations with the Louisville Water Co., which he said developed its own odor threshold for MCHM. Messina said he was told those consultations took place in a Jan. 14 conference call.

Kelley Dearing Smith, communications director for Louisville Water, said the company uses a panel of specially trained staffers for daily odor testing of its water supply.

"Louisville Water has a long history of dealing with and managing taste and odor issues," Smith said. "Many times, the compounds are not necessarily a health concern, but aesthetics plays a large role in our quality control and, of course, public perception. The taste of tap water is a big deal in Louisville. We're known for great-tasting water."

Louisville Water officials began their work when the MCHM plume in the Ohio River was above Cincinnati, which was around Jan. 13 or 14, Smith said. By the middle of the week, Louisville Water officials had settled on a figure they were comfortable with -- about 1 part per billion -- as an odor threshold for the chemical.

"In this instance, we had the luxury of planning time -- but we also believe our expertise played a role, too," Smith said. "We were using an odor threshold of 5 parts per billion. Turns out, it was 1 to 3 parts per billion, much more sensitive to the nose.

"We learned throughout the week that extremely sensitive people could detect the sweet odor of MCHM at 1 part per billion, although, for most people, it was 3 parts per billion."

Dietrich, the Virginia Tech scientist, said the Louisville figure is the lowest she's seen as a possible odor threshold for MCHM.

"I'm hoping that they're right and that the odor threshold is below the health threshold," Dietrich told the Gazette-Mail, "but that doesn't make the odor any less annoying. Odors in drinking water are important, even if they aren't a health concern."

Under federal law, water contaminants that present a public health threat are supposed to be regulated through the setting of enforceable "maximum contaminant levels," or MCLs. Other standards, called "secondary maximum contaminant levels," or SMCLs govern other concerns, such as taste, odor and color.

The EPA said it does not enforce the SMCLs. "They are established only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor," the EPA says on its website.

There are no federal or state MCLs or SMCLs for Crude MCHM.

The Tomblin administration and West Virginia American Water have indicated that following the ATSDR's flushing advice could have emptied the water system and, in the water company's words, "caused customers to go without water that was already determined to be under the health protective threshold for an indefinite amount of time."

Dietrich said the ATSDR guidance to flush plumbing systems until the water doesn't smell isn't a bad idea. However, she said, because the lack of a previously determine odor threshold -- and because people have different odor sensitivities -- that might have been a complicated process.

Also, Dietrich said, it's sometimes better in such situations to give the public more concrete advice, such as a specific amount of time to flush their pipes.

Still, she said, residents also have had reasonable questions about why public health officials have tested only at the water plant and hydrants -- and not in individual homes.

"The plastic pipes, in part, can be a reservoir," Dietrich said. "Even if it's not in the water hydrants or the mains, it could still be in people's homes."

While it might not be practical to take samples in the homes of 100,000 West Virginia American Water customers, she said, it would be possible to come up with a representative sample to meet public concerns for home testing.

"The public officials need to address people's concerns," Dietrich said. "That dialogue and that conversation are most important.

"It needs to go both ways," she said. "Everybody has constraints. The public has the constraint that they want to know that the water is safe, but it's not possible to do this testing in everybody's house.

"I do think the state, in terms of managing people's concerns, should establish a dialogue and then address what can be done."
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